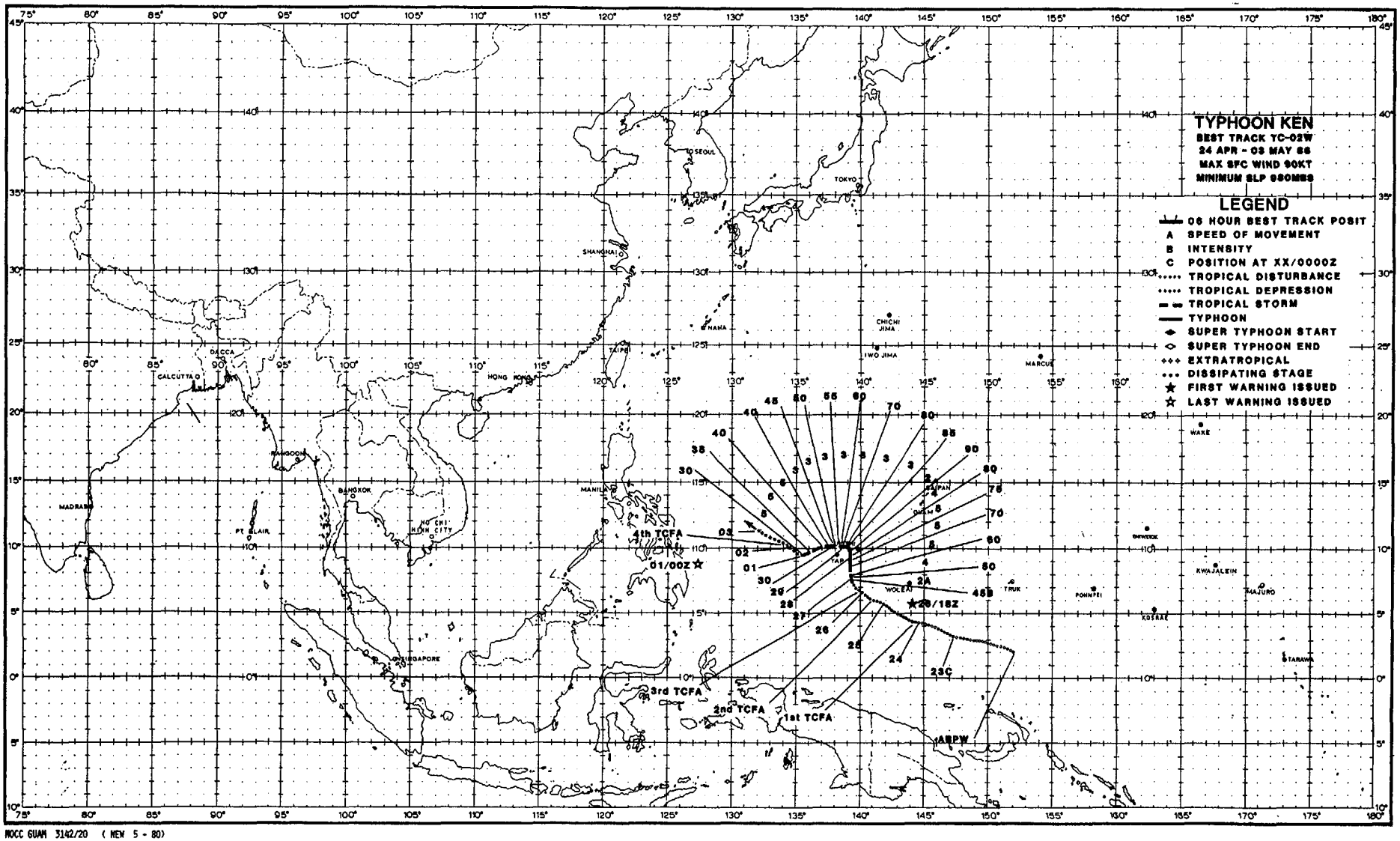


NOCC GUAM 3142/20 ( NEW 5 - 80)

Typhoon Ken, the second tropical cyclone of 1986, was also the first tropical cyclone to develop in the western North Pacific in April during the past five years. After the formation of Ken, two tropical systems quickly followed in May.

During late April, the near-equatorial trough was quite active with enhanced convective activity from the southern Philippine Islands to the region south of Truk near the equator. Embedded within this trough was the tropical disturbance that eventually intensified into Typhoon Ken. At 200600Z, it was mentioned on the Significant Tropical Weather Advisory (ABPW PGTW) for the first time. No surface circulation was present, only convergent flow at the low levels. Synoptic data on 21 April indicated a weak surface circulation 540 nm (1000 km) south of Guam. The associated convection increased in amount and organization through the 23rd. Analysis of satellite imagery showed continued development and winds were estimated at 20 kt (10 m/sec). As a result, JTWC issued a Tropical Cyclone Formation Alert (TCFA) at 240730Z.

The first aircraft reconnaissance investigative mission was conducted the following day. It located a weak circulation center at 5000 ft (1524 m) 250 nm (463 km) southeast of Yap. Estimated surface winds were 10 to 25 kt (5 to 13 m/sec). These data, plus satellite imagery, prompted JTWC to reissue the TCFA at 250730Z.

A second aircraft reconnaissance investigative mission was conducted on the morning of the 26th and was again unable to locate a surface circulation. Instead, a broad area of troughing was observed at the surface with the maximum low-level winds of 25 to 30 kt (13 to 15 m/sec) within the convection banding in the northeast quadrant of the disturbance. Satellite data indicated the upper-level circulation center existed 90 nm (167 km) to the east-southeast of Yap (Figure 3-02-1). Based on that information, the third TCFA was issued at 260730Z.

The first warning on Ken was issued at 261900Z after satellite imagery showed a significant increase in the central convection and the development of a comma-shaped cloud pattern. Surface winds were

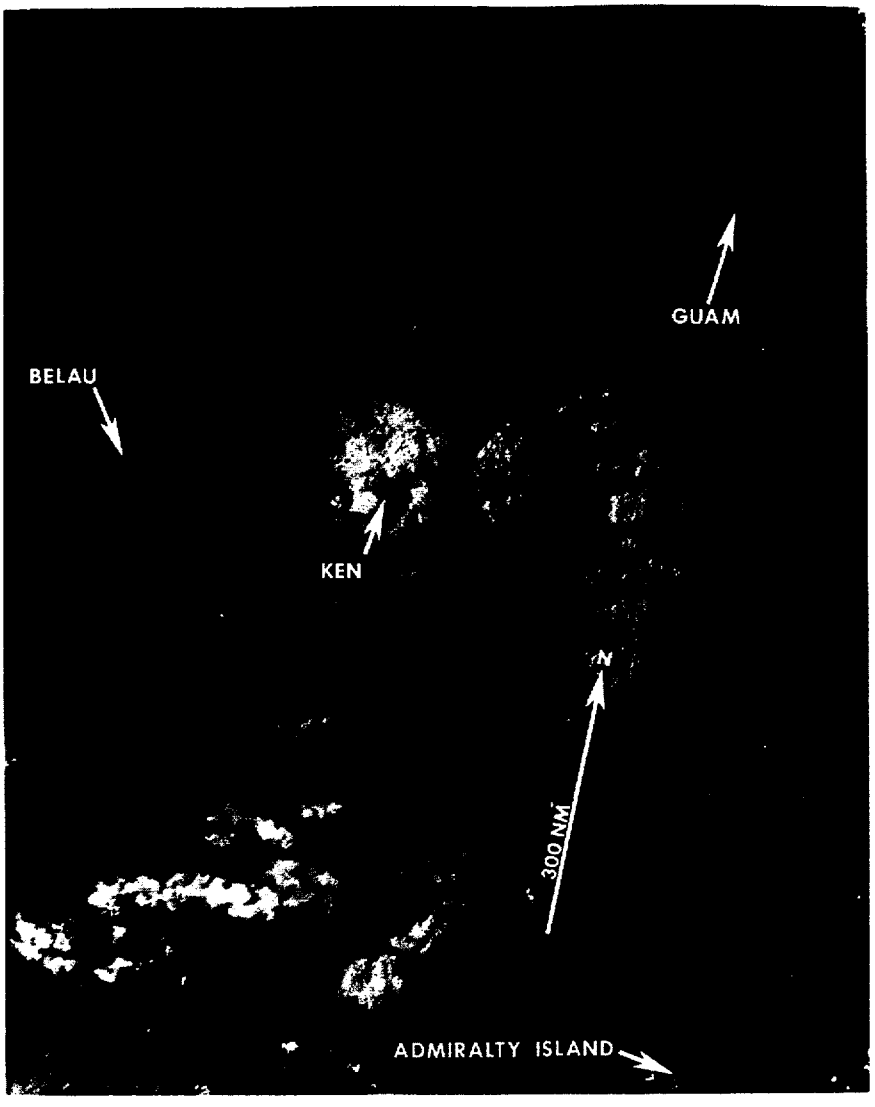


*Figure 3-02-1. Typhoon Ken at the time the third TCFA was issued. The aircraft reconnaissance investigative mission into the disturbance two hours earlier was unable to find a surface circulation (260500Z April NOAA visual imagery).*

estimated at 35 kt (18 m/sec). Ken reached typhoon intensity on the 27th. Aircraft reconnaissance penetration of the system revealed a compact surface circulation, a minimum sea-level pressure (MSLP) of 980 mb, and an elliptical eye (oriented east-west). Peripheral aircraft data showed the stronger surface winds of 30 to 50 kt (15 to 26 m/sec) in the northern semicircle in contrast to 15 to 20 kt (8 to 10 m/sec) in the southern semicircle. This resulted from the higher pressure gradient between Ken's low pressure center and the subtropical ridge. As gradual intensification took place, the forecast track for Ken became more northerly based on the expected influence of the mid-latitude trough on the mid-level subtropical ridge and the general tendency of intensifying tropical cyclones to move into higher latitudes. By 281800Z, after the trough passed eastward from Japan, the subtropical ridge reintensified across the northern Philippine Sea, forcing Ken to move westward.

Ken's intensity peaked at 90 kt (46 m/sec) on the 28th. Satellite imagery showed the system remained compact with a slight east-west elongation of the central dense overcast and an eye which was obscured by high cirrus. On the 29th, Ken began to weaken significantly. Aircraft reconnaissance reports indicated that the 700 mb center was displaced 20 nm (37 km) northeast of the surface center due to increased shearing flow aloft from the southwest. Throughout the next day, both aircraft and satellite reconnaissance found an exposed low-level circulation center. Since the upper-level circulation center was now displaced 170 nm (315 km) to the northeast of the low-level circulation (Figure 3-02-2), the last warning, valid at 0300Z on the first of May, was issued. Stripped of its deep central convection, the residual low-level cyclonic vorticity drifted westward and dissipated over water by the 3rd.

No reports of damage or injuries were attributed to Ken. Of interest, Ken's proximity to Guam and slow movement caused official concern because of the scheduled refueling stop of Air Force One at Andersen AFB. Once the tropical cyclone's track changed to west late on 28 April, serious worries were removed. In summary, forecasting direction changes for slow moving tropical cyclones is usually difficult - Ken was no exception. JTWC's ability to correctly forecast slow movement along the track resulted in a good product and excellent statistics.


*Figure 3-02-2. Typhoon Ken during its final stage. Note the large (170 nm (315 km)) displacement between the exposed low-level circulation and the upper-level circulation (302133Z April DMSP visual imagery).*